

Remarks

Applicant's respectfully request entry of this amendment. The following are applicant's response to issues raised in the Office Action.

Priority:

The priority reference to the provisional patent application has been added to the specification.

Drawing Objection:

Figure 1 was objected to as not having the legend 'prior art'. A replacement sheet for figure 1 is enclosed with the legend 'prior art ' added. Withdrawal of the drawing objection is respectfully requested.

Claim Objection:

Claim 4 was objected to due to a missing period. Accordingly, claim 4 has been amended. Withdrawal of the claim objection is respectfully requested.

Allowable Subject Matter:

Applicants gratefully acknowledge the allowance of claims 34 and 35.

Rejection under 35 U.S.C. 103:

Claims 1 and 8 were rejected under 35 U.S.C. 103 as being unpatentable over Figure 1 in view of Cygan (US 5,015,972) and Abel (US 6,198,374).

Cygan discloses a broadband RF transformer. Abel discloses a multi-layer transformer apparatus and method.

Neither Figure 1, nor Cygan, nor Abel, teach, disclose or suggest as in amended claim 1, a directional coupler that has a substrate with several layers and a film resistor that is formed on a top layer. A capacitor is formed between two of the layers. A ground plane is formed on one of the layers. A transformer is attached to the top layer over the resistor. Vias extend between the layers to provide an electrical connection between the resistor, capacitor, ground plane and transformer.

None of the cited references disclose or suggest the use of a transformer that is attached to the top layer of the substrate over the resistor. If the resistor was not mounted under the transformer, it would have to be mounted to the side of the transformer resulting in a larger device that would take up more space when mounted to a printed circuit board. There is no mention in figure 1 of a ground plane or electrodes.

There is no suggestion in the cited references to mount a transformer over a resistor on a multi-layered substrate in order to produce a more compact coupler.

If the combination of Figure 1, Cygan and Abel was made, it would still lack a resistor under a transformer. There is no mention of resistor placement in the cited references.

Dependent claims 2-8 depend from independent claim 1 and add additional patentable features and are allowable therewith.

Claims 2, 9-12 and 24-32 were rejected under 35 U.S.C. 103 as being unpatentable over Figure 1 in view of Cygan (US 5,015,972) and Abel (US 6,198,374) and Lillo (US 2002/0175775 A1).

Lillo discloses spiral couplers.

Neither Figure 1, nor Cygan, nor Abel, nor Lillo, teach, disclose or suggest as in amended claim 9, a coupler that has a resistor formed on the top surface under the transformer. The resistor is electrically connected with the transformer.

In contrast, none of the cited references show mounting of a transformer on a substrate, much less a transformer mounted over a resistor. Abel does not show a transformer mounted to a top surface. By mounting the transformer over the resistor a smaller coupler is obtained.

Further, there is no suggestion to combine the cited references. Such a combination can only be gleaned through hindsight reasoning. It has been held that one cannot use hindsight reconstruction to pick and chose among isolated disclosures in the prior art to depreciate the claimed invention. In Re Fine, 5 USPQ2d 1596, 1600 (Fed. Cir. 1988).

Dependent claims 10-17 depend from independent claim 9 and add additional patentable features and are allowable therewith.

Neither Figure 1, nor Cygan, nor Abel, nor Lillo, teach, disclose or suggest as in amended claim 24, a directional coupler that has a low temperature co-fired ceramic substrate having a plurality of layers with a resistor formed on a first layer. An overglaze is located over the resistor, to protect the resistor. A transformer is attached to the substrate and is electrically connected to the ports.

The overglaze protects the resistor and prevents the transformer from shorting out the resistor.

None of the cited references show a transformer mounted over an overglaze over a resistor on a low temperature co-fired ceramic substrate. By mounting the transformer over the resistor a directional coupler with a smaller footprint is obtained.

Dependent claims 28-33 and 35 depend from independent claim 24 and add additional patentable features and are allowable therewith.

Conclusion:

In view of the current amendments and remarks, the claims are now believed to be in condition for allowance.

Respectfully submitted,



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